

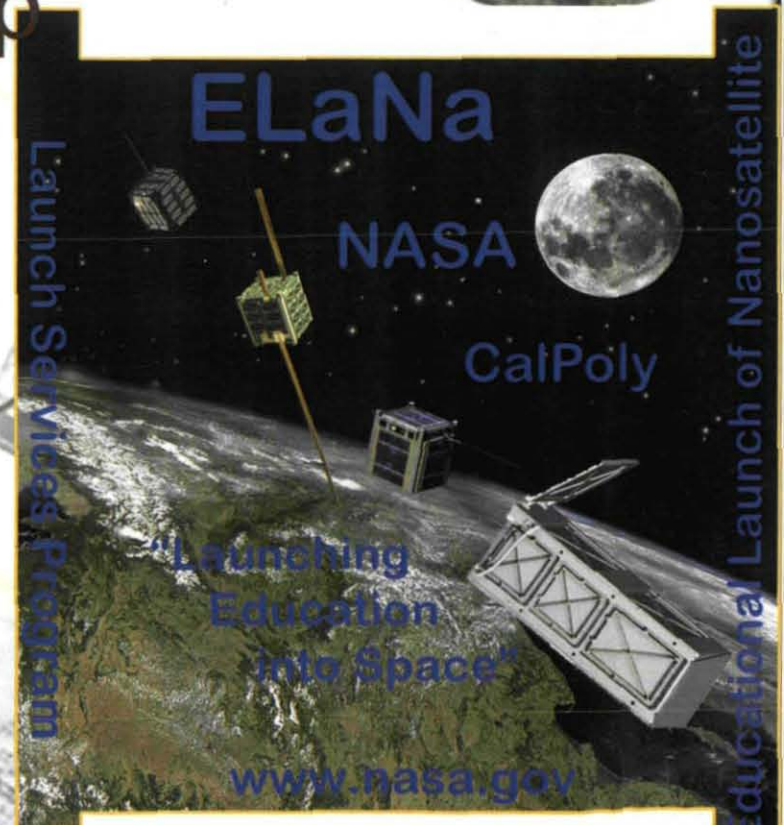
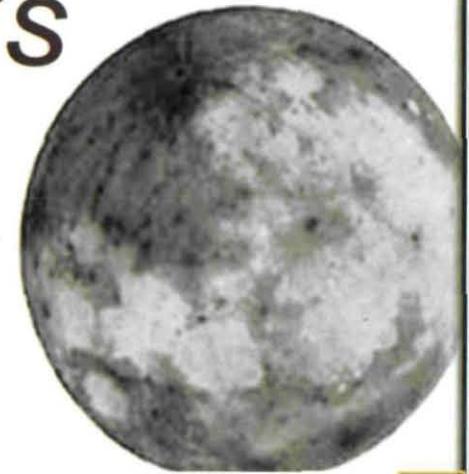


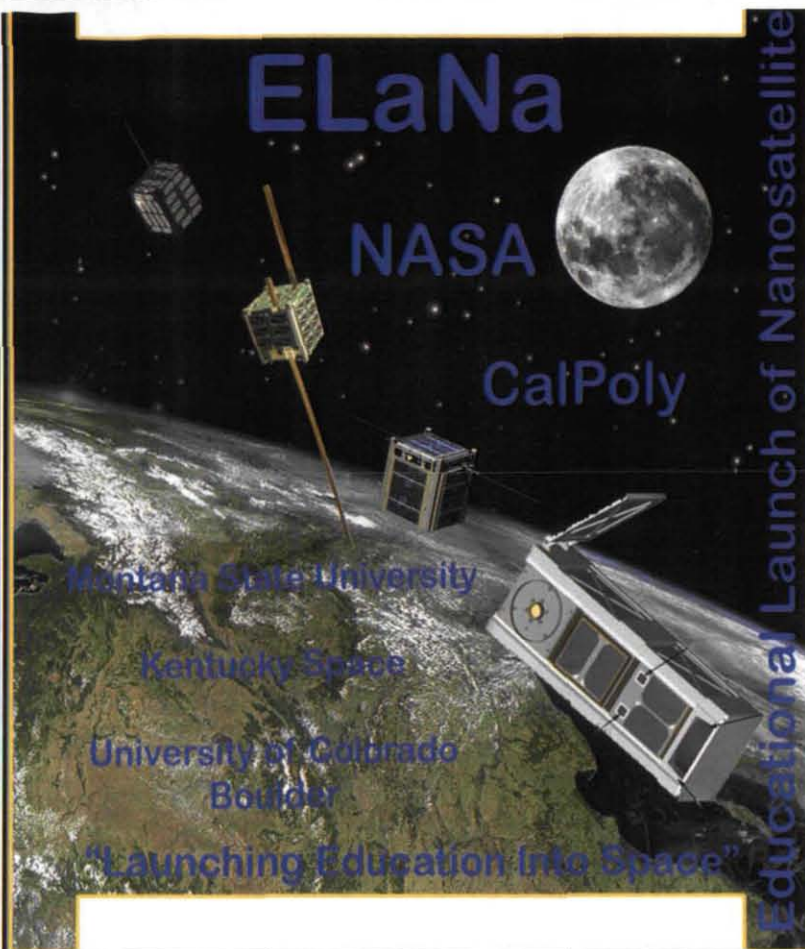
LAUNCH SERVICES PROGRAM

Project ELaNa and NASA's CubeSat Initiative

CalPoly 2010
Summer CubeSat Workshop
Small Satellite Conference
Utah State University

Garrett Skrobot
ELaNa Project/Mission Manager
Flight Project Office
Launch Services Program





Launch Services Program Involvement

ELaNa – Education Launch of Nanosatellite

LAUNCH SERVICES PROGRAM

“Launching Education into Space”

An effort to return educational spaceflight to NASA

Currently planning to fly on ELV some time in 2010 (once we get HQ approval)

Developing the capability to fly P-Pods on LSP procured Launch Vehicles

What is the importance of PPOD/CubeSats?

- To bring back an Educational element to space flight - University Payload Program
- Can help in meeting NASA Goal and Vision of going to the Moon and Mars
- Increase Payload Capability for our customers
- Training future engineers and scientist to enter into the aerospace field

Who is ELaNa?

The first ELaNa mission is comprised of three University CubeSats to demonstrate various technology

Montana State University

Kentucky Space

University of Colorado – Boulder



Educational Developments

LSP Future Developments

Start a University Payload Project that will allow universities to build a CubeSat type payload to provide information that will aid or verify NASA Projects designs while providing higher education research

Last summer's FPO Intern student started the ground work for the first LSP CubeSat Development Payload

- This will be a 2U CubeSat that will measure launch vehicle environments at the CubeSat location

There will be a call for proposals put out to the university community from which three will be selected to proceed to PDR - 2 year program

Education 9th to 12th

CubeSat projects can be developed in the high schools environment by using CubeSat development kits.

Currently Thomas Jefferson High School has an active CubeSat Project and is now preparing for a flight

These kits can be used to promote Science, Technology, Engineering and Mathematics while preparing students for college programs



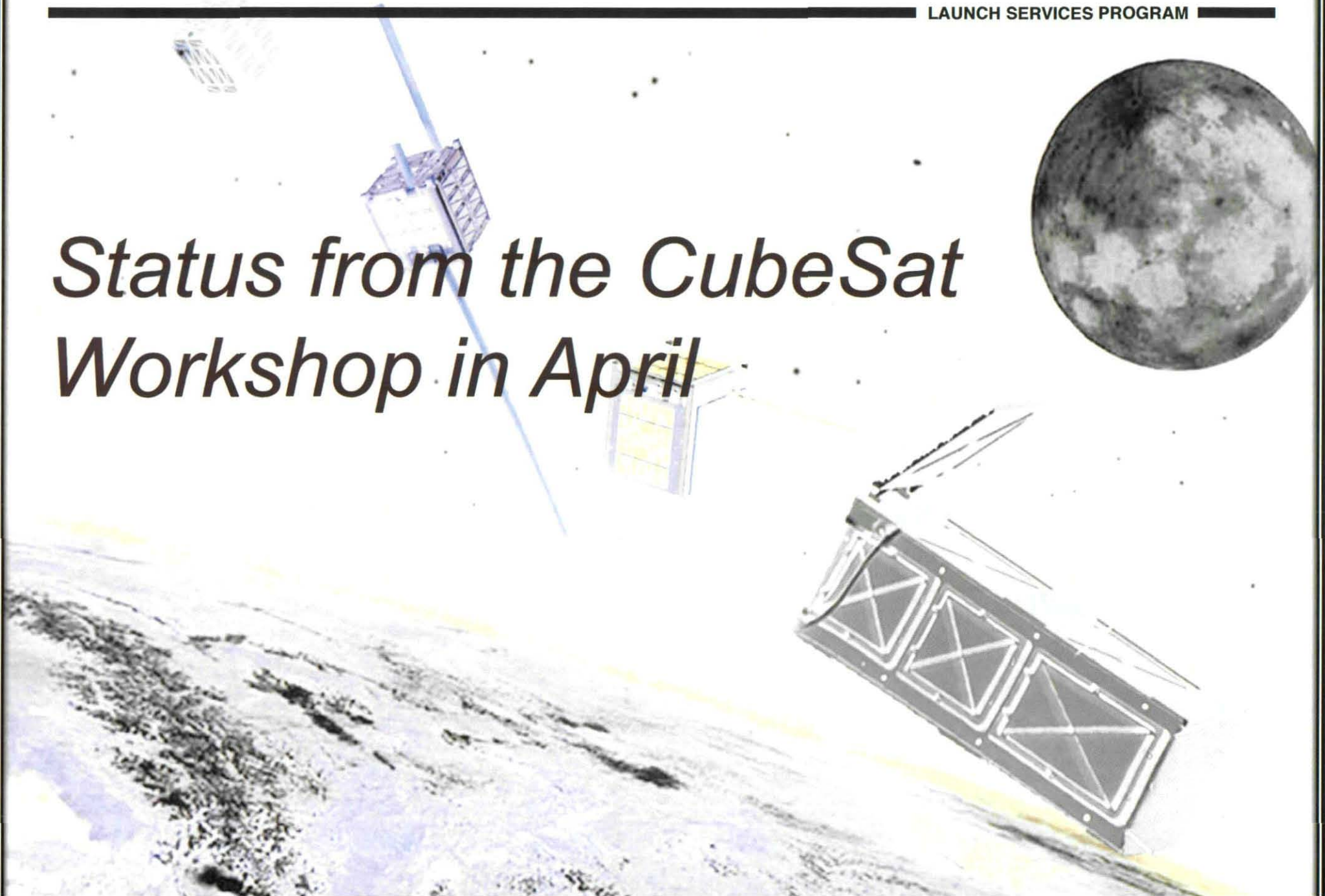
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Summer CubeSat Workshop

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*Status from the CubeSat
Workshop in April*





Summer CubeSat Workshop

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Announcement of CubeSat Launch Initiative

February 23, 2010

The National Aeronautics and Space Administration (NASA) Space Operations Mission Directorate (SOMD) anticipates that launch opportunities for a limited number of CubeSats may be available on launches currently planned for 2011 and 2012. These launch opportunities would constitute a pilot project intended to demonstrate viable launch opportunities for CubeSat payloads as auxiliary payloads on planned missions.

Response Date: April 15, 2010

Selection Notification: Selection is anticipated by June 30, 2010

I hope that every CubeSat project submitted!



Summer CubeSat Workshop

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So what was the out come of the Announcement?

16 - Proposals were received

One proposal was removed due to not having a NASA relationship

Three proposal were removed due to not meeting the requirements of the proposal

12 Proposal (CubeSat mission) were selected and are now being manifested on ELVs





Current Mission

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ELaNa — Educational Launch of Nanosatellite

Glory Mission — November 22, 2010

1 P-POD - Taurus XL

1U Montana State Univ — Prime F1

1U Kentucky Space — KYSat

1U Univ of Colorado — HERMES

Falcon 1e Enabler Mission — 2011

2 CubeSats

Unv of Florida - SwampSat

CalPoly — CP5

NPP Mission — October 2011

3 P-Pods — Delta II

2U Univ of Michigan — COVE/McCabe

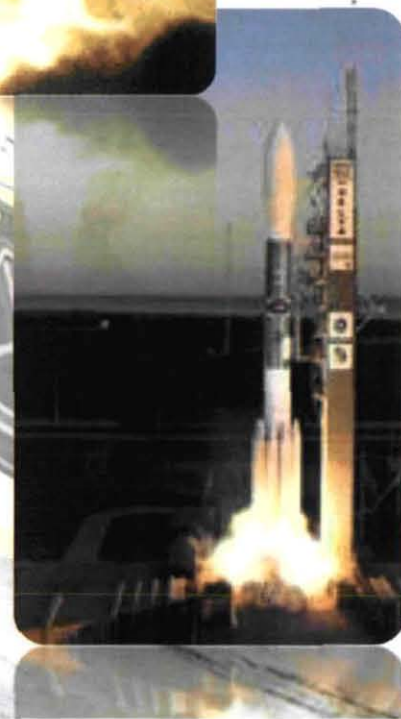
1U Montana State Univ — Prime F2

3U Univ of Michigan — RAX

3U Utah St Univ, - DICE

Back Up

3U Univ of California — CINEMA





Current Missions

LAUNCH SERVICES PROGRAM

ELaNa – Educational Launch of Nanosatellite

CRS#2 – October, 2011

4 P-POD – Falcon 9

Manifest is in work and CubeSats will come from the CubeSats initiative announcement

CRS#3 – NET March, 2012

5 P-POD – Falcon 9

Manifest is in work and CubeSats will come from the CubeSats initiative announcement

So how does a CubeSat increase their chances to get on orbit? –

Design to the minimum orbital requirement of the CRS missions 325km @ 51 degrees inclination

Future CRS Mission may have the ability to go to higher orbit





Manifesting

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CubeSat Launch Initiative

CubeSat Missions

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*
*

CubeSat Missions

NASA CubeSat Missions

CubeSat Missions

*
*
*

CubeSat Missions

Selection Representatives

SOMD

OCT

ESMD

ISS

SMD

Education

IPP

DoD

CubeSat Missions
Selection List
CubeSat 1
CubeSat 2
CubeSat 3
*
*
*
CubeSat N

**Launch Services Program
perform manifesting and
management of CubeSats
integration on ELVs**





Summer CubeSat Workshop

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Announcement of CubeSat Launch Initiative ***July 30, 2010***

The newly release announcement is very similar to the first release however there are some changes

- Proposal development from 45 to 107 days
- The previous announcement required development efforts to be conducted under existing NASA-supported activities. This announcement relieves this requirement and will judge otherwise qualified submissions solely against the selection criteria.

Response Date: November 15, 2010

Selection Notification: Selection is anticipated by January 30, 2011

I hope that every CubeSat project submits!





Flight Rate

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What are the current estimates for possible flight opportunities for P-PODs to maintain sustainability?

	FY11	FY12	FY13	FY14
# of PPODs	1	12	8 - 10	8 - 10

My question to the community is:

If NASA secures these opportunities, will there be CubeSats there to fly?



Future Mission

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NASA — Launch Services Program continues to perform studies on developing capabilities to integrate both P-PODs and Small Deployables on ELVs

These studies are focusing on a common interface for small deployables between ELVs currently on contract

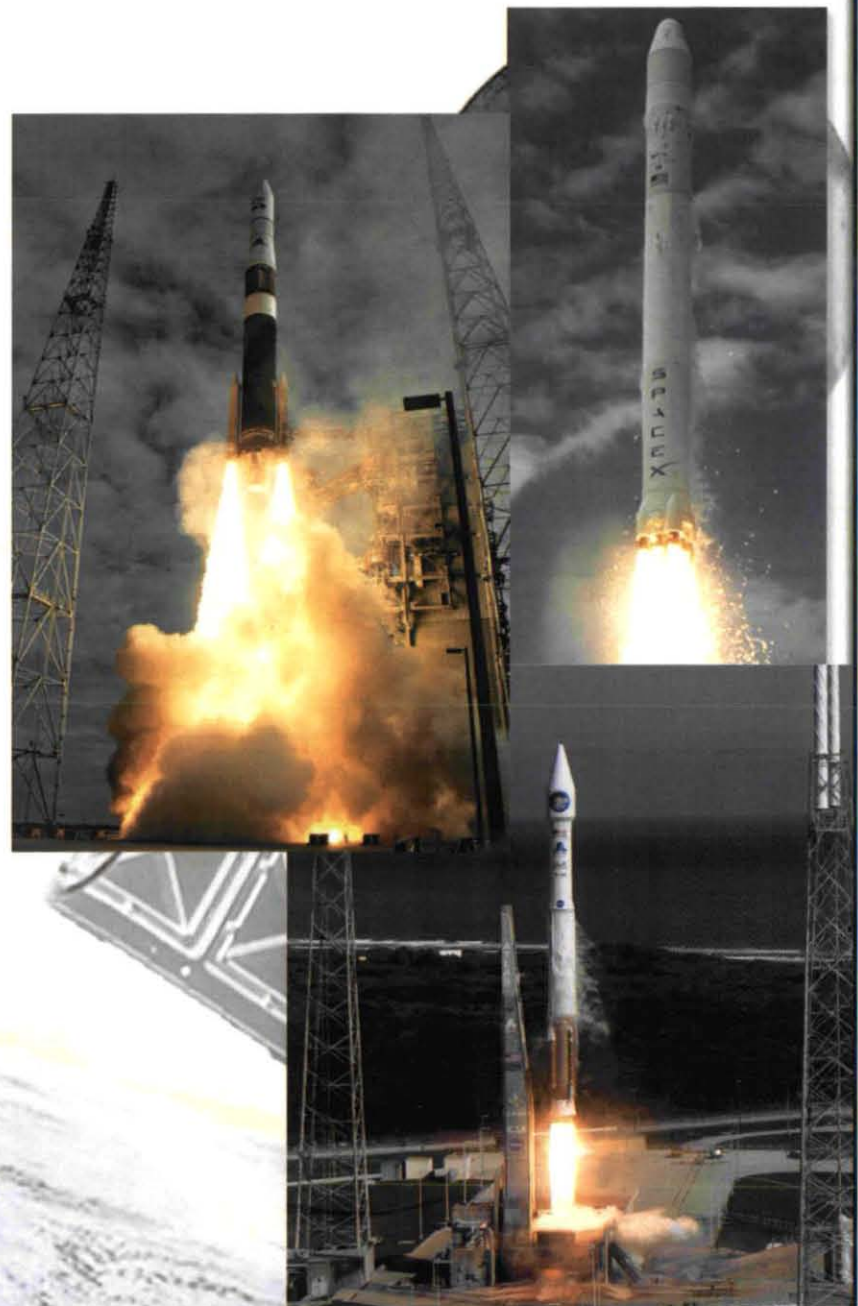
With common interfaces should come standards for small deployable mission

3U P-POD

6U Deployer,

8 inch interface

15 inch interface





In Summary

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ELaNa — Educational Launch of Nanosatellite
"Launch Education into Space"

Two Announcements of CubeSat Launch Initiative
targeting CubeSat to be launched on NASA ELVs

Two launches have been manifested and there are two
additional launches in the manifesting process

Developing flight opportunities for P-PODs to maintain
sustainability for CubeSats

CubeSats need to be there to maintain flight opportunities





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Questions

